



Manufacture of polyketones

Description of Technology: Polyketones are manufactured by reacting an aromatic carboxylic acid with a biractive aromatic compound, using as a catalyst a combination of a carboxylic acid anhydride and phosphoric acid, or equivalent thereof. The product polymers are useful as molding resins.

Patent Listing:

1. **US Patent No. 6,538,098**, Issued on March 25, 2003, "Manufacture of polyketones"
<http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetacgi%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=6,538,098.PN.&OS=PN/6,538,098&RS=PN/6,538,098>

Market Potential: Polyketones, especially aromatic polyketones, are important engineering polymers, often having the advantages of chemical resistance, good high temperature properties, good tensile properties, and others. Typical engineering polyketones are poly(etheretherketone) (PEEK) (I), and poly(etherketone) (PEK) (II), having the repeat units ##STR1##

Most commonly these polymers have been made by the condensation of an aromatic hydroxy compound with an aromatic fluoride. For example, PEEK may be made by the reaction of 4,4'-difluorobenzophenone with the dianion of hydroquinone, while PEK may be made by the reaction of 4,4'-difluorobenzophenone with the dianion of 4,4'-dihydroxybenzophenone, or the base promoted self condensation of 4-fluoro-4'-hydroxybenzophenone. While these reactions suffice to make the desired polymers, they have serious disadvantages. The benzophenone monomers required are expensive, and the reactions produce byproducts such as inorganic fluorides which must be properly disposed of

Another method of making aromatic ketones is the Friedel-Crafts synthesis. While this may employ somewhat cheaper ingredients the reaction is often more difficult to run and unwanted byproducts are produced. For example at least stoichiometric quantities of a Lewis acid such as aluminum chloride must be used, which later must be separated from the polymer and discarded or otherwise used. Therefore improved methods of making polyketones are desired.

Benefits:

- Improved method of making polyketones
- Retains chemical resistance, good high temperature properties, and good tensile properties

Applications:

- Molding resins

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